# WHO Model List of Essential Medicines for Children

**2nd List, March 2009**

**Status of this document**

**This is a reprint of the text on the WHO Medicines web site**

http://www.who.int/medicines/publications/essentialmedicines/en/index.html

# WHO Model List of Essential Medicines for Children

## Explanatory Notes

**This Model List is intended for use for children up to 12 years of age.**

The **core list** presents a list of minimum medicine needs for a basic health care system, listing the most efficacious, safe and cost-effective medicines for priority conditions. Priority conditions are selected on the basis of current and estimated future public health relevance, and potential for safe and cost-effective treatment.

The **complementary list** presents essential medicines for priority diseases, for which specialized diagnostic or monitoring facilities, and/or specialist medical care, and/or specialist training are needed. In case of doubt medicines may also be listed as complementary on the basis of consistent higher costs or less attractive cost-effectiveness in a variety of settings.

The **square box symbol (□)** is primarily intended to indicate similar clinical performance within a pharmacological class. The listed medicine should be the example of the class for which there is the best evidence for effectiveness and safety. In some cases, this may be the first medicine that is licensed for marketing; in other instances, subsequently licensed compounds may be safer or more effective. Where there is no difference in terms of efficacy and safety data, the listed medicine should be the one that is generally available at the lowest price, based on international drug price information sources.

Therapeutic equivalence is only indicated on the basis of reviews of efficacy and safety and when consistent with WHO clinical guidelines. National lists should not use a similar symbol and should be specific in their final selection, which would depend on local availability and price.

The format and numbering of the 16th WHO Model List of Essential Medicines have been retained but, as indicated in the text, some sections have been deleted because they contain medicines that are not relevant for children.

**a** indicates that there is an age or weight restriction on use of the medicines; the details for each medicine are in Table 1.

In the List of Essential Medicines for Children, an additional symbol is used:

**R** indicates that the Subcommittee has endorsed the medicine as essential but has requested a review of the efficacy and safety to confirm this decision, or to expand use to additional age groups.

The presence of an entry on the Essential Medicines List carries no assurance as to pharmaceutical quality. It is the responsibility of the relevant national or regional drug regulatory authority to ensure that each product is of appropriate pharmaceutical quality (including stability) and that when relevant, different products are interchangeable.

For recommendations and advice concerning all aspects of the quality assurance of medicines see the WHO Medicines web site http://www.who.int/medicines/areas/quality_assurance/en/index.html

Medicines and dosage forms are listed in alphabetical order within each section and there is no implication of preference for one form over another. Standard treatment guidelines should be consulted for information on appropriate dosage forms.

The main terms used for dosage forms in the Essential Medicines List can be found in Annex 1. Definitions of many of these terms and pharmaceutical quality requirements applicable to the different categories are published in the current edition of *The International Pharmacopoeia* http://www.who.int/medicines/publications/pharmacopoeia/en/index.html.

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| **1. ANAESTHETICS** | |
| **1.1 General anaesthetics and oxygen** | |
| ☐ halothane R | **Inhalation.**<br>R Review for alternative inhalational agents. |
| ketamine | **Injection:** 50 mg (as hydrochloride)/ml in 10-ml vial. |
| nitrous oxide | **Inhalation.** |
| oxygen | **Inhalation** (medicinal gas). |
| thiopental | **Powder for injection:** 0.5 g; 1 g (sodium salt) in ampoule. |
| **1.2 Local anaesthetics** | |
| ☐ bupivacaine | **Injection:** 0.25%; 0.5% (hydrochloride) in vial.<br>**Injection for spinal anaesthesia:** 0.5% (hydrochloride) in 4-ml ampoule to be mixed with 7.5% glucose solution. |
| ☐ lidocaine | **Injection:** 1%; 2% (hydrochloride) in vial.<br>**Injection for spinal anaesthesia:** 5% (hydrochloride) in 2-ml ampoule to be mixed with 7.5% glucose solution.<br>**Topical forms:** 2% to 4% (hydrochloride). |
| lidocaine + epinephrine (adrenaline) | **Dental cartridge:** 2% (hydrochloride) + epinephrine 1:80 000.<br>**Injection:** 1%; 2% (hydrochloride) + epinephrine 1:200 000 in vial. |
| **1.3 Preoperative medication and sedation for short-term procedures** R<br>R Review of appropriate preoperative medication and sedation in children. | |
| atropine | **Injection:** 1 mg (sulfate) in 1-ml ampoule. |
| ☐ diazepam | **Injection:** 5 mg/ml in 2-ml ampoule.<br>**Tablet**: 5 mg. |
| morphine | **Injection:** 10 mg (sulfate or hydrochloride) in 1-ml ampoule. |
| **2. ANALGESICS, ANTIPYRETICS, NON-STEROIDAL ANTI-INFLAMMATORY MEDICINES (NSAIMs), MEDICINES USED TO TREAT GOUT AND DISEASE MODIFYING AGENTS IN RHEUMATOID DISORDERS (DMARDs)** | |
| **2.1 Non-opioids and non-steroidal anti-inflammatory medicines (NSAIMs)** | |
| ibuprofen a R | **Tablet:** 200 mg; 400 mg.<br>a >3 months.<br>R Use in children, focusing on comparative analgesic and antipyretic efficacy and safety. |
| paracetamol* | **Oral liquid:** 125 mg/5 ml.<br>**Suppository:** 100 mg.<br>**Tablet:** 100 mg to 500 mg.<br>* Not recommended for anti-inflammatory use due to lack of proven benefit to that effect. |

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| *Complementary List* | |
| *acetylsalicylic acid** | ***Suppository:*** *50 mg to 150 mg.*<br>***Tablet:*** *100 mg to 500 mg.*<br>** For use for rheumatic fever, juvenile arthritis, Kawasaki disease.* |
| **2.2 Opioid analgesics** | |
| codeine | **Tablet:** 15 mg (phosphate). |
| morphine | **Injection:** 10 mg (morphine hydrochloride or morphine sulfate) in 1-ml ampoule.<br>**Oral liquid:** 10 mg (morphine hydrochloride or morphine sulfate)/5 ml.<br>**Tablet:** 10 mg (morphine sulfate).<br>**Tablet (prolonged release):** 10 mg; 30 mg; 60 mg (morphine sulfate). |
| ~~**2.3 Medicines used to treat gout**~~ | |
| **2.4 Disease modifying agents used in rheumatoid disorders (DMARDs)** R<br>R The Subcommittee noted that there is a need for medicines for the treatment of juvenile arthritis but did not endorse any of the currently listed medicines at this time, requesting a review of this section. | |
| **3. ANTIALLERGICS AND MEDICINES USED IN ANAPHYLAXIS** | |
| ☐ chlorphenamine a R | **Injection:** 10 mg (hydrogen maleate) in 1-ml ampoule.<br>**Oral liquid:** 2 mg/5 ml.<br>**Tablet:** 4 mg (hydrogen maleate).<br>a >1 year.<br>R Review of diphenhydramine to assess comparative efficacy and safety with chlorphenamine as a possible preferable alternative. |
| dexamethasone | **Injection:** 4 mg dexamethasone phosphate (as disodium salt) in 1-ml ampoule. |
| epinephrine (adrenaline) | **Injection:** 1 mg (as hydrochloride or hydrogen tartrate) in 1-ml ampoule. |
| hydrocortisone | **Powder for injection:** 100 mg (as sodium succinate) in vial. |
| ☐ prednisolone | **Oral liquid:** 5 mg/ml.<br>**Tablet:** 5 mg; 25 mg. |
| **4. ANTIDOTES AND OTHER SUBSTANCES USED IN POISONINGS** | |
| **4.1 Non-specific** | |
| charcoal, activated | **Powder.** |
| **4.2 Specific** | |
| acetylcysteine | **Injection:** 200 mg/ml in 10-ml ampoule.<br>**Oral liquid:** 10% and 20%. |
| atropine | **Injection:** 1 mg (sulfate) in 1-ml ampoule. |
| calcium gluconate | **Injection:** 100 mg/ml in 10-ml ampoule. |

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| deferoxamine R | **Powder for injection:** 500 mg (mesilate) in vial.<br>R Review use of oral iron and lead chelators in children. |
| dimercaprol | **Injection in oil:** 50 mg/ml in 2-ml ampoule. |
| naloxone | **Injection:** 400 micrograms (hydrochloride) in 1-ml ampoule. |
| penicillamine R | **Solid oral dosage form:** 250 mg.<br>R Comparative effectiveness and safety versus sodium calcium edetate. |
| sodium calcium edetate R | **Injection:** 200 mg/ml in 5-ml ampoule.<br>R Comparative effectiveness and safety versus penicillamine. |
| **5. ANTICONVULSANTS/ANTIEPILEPTICS** | |
| carbamazepine | **Oral liquid:** 100 mg/5 ml.<br>**Tablet (chewable):** 100 mg; 200 mg.<br>**Tablet (scored):** 100 mg; 200 mg. |
| diazepam | **Gel or rectal solution:** 5 mg/ml in 0.5 ml; 2-ml and 4-ml tubes. |
| □ lorazepam | **Parenteral formulation:** 2 mg/ml in 1-ml ampoule; 4 mg/ml in 1-ml ampoule. |
| phenobarbital | **Injection:** 200 mg/ml (phenobarbital sodium).<br>**Oral liquid:** 15 mg/5 ml (phenobarbital).<br>**Tablet:** 15 mg to 100 mg (phenobarbital). |
| phenytoin | **Capsule:** 25 mg; 50 mg; 100 mg (sodium salt).<br>**Injection:** 50 mg/ml in 5-ml vial (sodium salt).<br>**Oral liquid:** 25 mg to 30 mg/5 ml.*<br>**Tablet:** 25 mg; 50 mg; 100 mg (sodium salt).<br>**Tablet (chewable):** 50 mg.<br>* The presence of both 25 mg/5 ml and 30 mg/5 ml strengths on the same market would cause confusion in prescribing and dispensing and should be avoided. |
| valproic acid (sodium valproate) | **Oral liquid:** 200 mg/5 ml.<br>**Tablet (crushable):** 100 mg.<br>**Tablet (enteric-coated):** 200 mg; 500 mg (sodium valproate). |
| *Complementary List* | |
| *ethosuximide* | ***Capsule:*** *250 mg.*<br>***Oral liquid:*** *250 mg/5 ml.* |
| **6. ANTI-INFECTIVE MEDICINES** | |
| **6.1 Anthelminthics** R<br>R Review evidence of efficacy and safety of use of anthelminth/antifilarial/antischistosomal and antitrematode medicines in children below the specified age in current licences. | |
| ***6.1.1 Intestinal anthelminthics*** R | |
| albendazole | **Tablet (chewable):** 400 mg. |

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| levamisole | **Tablet:** 50 mg; 150 mg (as hydrochloride). |
| □ mebendazole | **Tablet (chewable):** 100 mg; 500 mg. |
| niclosamide* | **Tablet (chewable):** 500 mg.<br>* Niclosamide is listed for use when praziquantel treatment fails. |
| praziquantel | **Tablet:** 150 mg; 600 mg. |
| pyrantel | **Oral liquid:** 50 mg (as embonate)/ml.<br>**Tablet (chewable):** 250 mg (as embonate). |
| ***6.1.2 Antifilarials*** R | |
| ivermectin | **Tablet (scored):** 3 mg; 6 mg. |
| ***Complementary List*** | |
| *diethylcarbamazine* | ***Tablet:** 50 mg; 100 mg (dihydrogen citrate).* |
| ***6.1.3 Antischistosomals and antitrematode medicines*** R | |
| praziquantel | **Tablet:** 600 mg. |
| triclabendazole | **Tablet:** 250 mg. |
| ***Complementary List*** | |
| *oxamniquine** | ***Capsule:** 250 mg.*<br>***Oral liquid:** 250 mg/5 ml.*<br>** Oxamniquine is listed for use when praziquantel treatment fails.* |
| **6.2 Antibacterials** | |
| ***6.2.1 Beta Lactam medicines*** | |
| amoxicillin | **Powder for oral liquid:** 125 mg (anhydrous)/5 ml; 250 mg (anhydrous)/5 ml.<br>**Solid oral dosage form:** 250 mg; 500 mg (anhydrous). |
| amoxicillin + clavulanic acid | **Oral liquid:** 125 mg amoxicillin + 31.25 mg clavulanic acid/5 ml AND 250 mg amoxicillin + 62.5 mg clavulanic acid/5 ml.<br>**Tablet:** 500 mg + 125 mg. |
| ampicillin | **Powder for injection:** 500 mg; 1 g (as sodium salt) in vial. |
| benzathine benzylpenicillin | **Powder for injection:** 900 mg benzylpenicillin (=1.2 million IU) in 5-ml vial; 1.44 g benzylpenicillin (=2.4 million IU) in 5-ml vial. |
| benzylpenicillin | **Powder for injection:** 600 mg (= 1 million IU); 3 g (= 5 million IU) (sodium or potassium salt) in vial. |
| cefalexin | **Powder for reconstitution with water:** 125 mg/5 ml; 250 mg/5 ml.<br>**Solid oral dosage form:** 250 mg. |
| □ cefazolin* a | **Powder for injection:** 1 g (as sodium salt) in vial.<br>* For surgical prophylaxis.<br>a >1 month. |

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| ceftriaxone* a | **Powder for injection:** 250 mg; 1 g (as sodium salt) in vial.<br>* Do not administer with calcium and avoid in infants with hyperbilirubinemia.<br>a >41 weeks corrected gestational age. |
| □ cloxacillin | **Capsule:** 500 mg; 1 g (as sodium salt).<br>**Powder for injection:** 500 mg (as sodium salt) in vial.<br>**Powder for oral liquid:** 125 mg (as sodium salt)/5 ml. |
| phenoxymethylpenicillin | **Powder for oral liquid:** 250 mg (as potassium salt)/5 ml.<br>**Tablet:** 250 mg (as potassium salt). |
| procaine benzylpenicillin* | **Powder for injection:** 1 g (=1 million IU); 3 g (=3 million IU) in vial.<br>* Procaine benzylpenicillin is not recommended as first-line treatment for neonatal sepsis except in settings with high neonatal mortality, when given by trained health workers in cases where hospital care is not achievable. |
| ***Complementary List*** | |
| *cefotaxime** | ***Powder for injection:*** *250 mg per vial.*<br>** 3rd generation cephalosporin of choice for use in hospitalized neonates.* |
| *ceftazidime* | ***Powder for injection:*** *250 mg or 1 g (as pentahydrate) in vial.* |
| *imipenem* + cilastatin** | ***Powder for injection:*** *250 mg (as monohydrate) + 250 mg (as sodium salt); 500 mg (as monohydrate) + 500 mg (as sodium salt) in vial.*<br>** Only listed for the treatment of life-threatening hospital-based infection due to suspected or proven multidrug-resistant infection. Meropenem is indicated for the treatment of meningitis and is licensed for use in children over the age of 3 months.* |
| ***6.2.2 Other antibacterials*** | |
| azithromycin* | **Capsule:** 250 mg; 500 mg.<br>**Oral liquid:** 200 mg/5 ml.<br>* Only listed for trachoma. |
| chloramphenicol | **Capsule:** 250 mg.<br>**Oily suspension for injection*:** 0.5 g (as sodium succinate)/ml in 2-ml ampoule.<br>* Only for the presumptive treatment of epidemic meningitis in children older than 2 years.<br>**Oral liquid:** 150 mg (as palmitate)/5 ml.<br>**Powder for injection:** 1 g (sodium succinate) in vial. |
| ciprofloxacin R | **Oral liquid**: 250 mg/5 ml.<br>**Solution for IV infusion:** 2 mg/ml.<br>**Tablet:** 250 mg (as hydrochloride). |

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| doxycycline **a** | **Oral liquid:** 25 mg/5 ml; 50 mg/5 ml.<br>**Solid oral dosage form:** 50 mg; 100 mg (hydrochloride).<br>**a** Use in children <8 years only for life-threatening infections when no alternative exists. |
| erythromycin | **Powder for oral liquid:** 125 mg/5 ml (as stearate or ethyl succinate).<br>**Solid oral dosage form:** 250 mg (as stearate or ethyl succinate). |
| □ gentamicin | **Injection:** 10 mg; 40 mg (as sulfate)/ml in 2-ml vial. |
| metronidazole | **Injection:** 500 mg in 100-ml vial.<br>**Oral liquid:** 200 mg (as benzoate)/5 ml.<br>**Tablet:** 200 mg to 500 mg. |
| nitrofurantoin | **Oral liquid:** 25 mg/5 ml.<br>**Tablet:** 100 mg. |
| sulfamethoxazole + trimethoprim | **Injection:**<br>80 mg + 16 mg/ml in 5-ml ampoule;<br>80 mg + 16 mg/ml in 10-ml ampoule.<br>**Oral liquid:** 200 mg + 40 mg/5 ml.<br>**Tablet:** 100 mg + 20 mg; 400 mg + 80 mg. |
| trimethoprim **a** | **Oral liquid:** 50 mg/5 ml.<br>**Tablet:** 100 mg; 200 mg.<br>**a** >6 months. |
| ***Complementary List*** | |
| *clindamycin* | ***Capsule:*** *150 mg.*<br>***Injection:*** *150 mg (as phosphate)/ml.*<br>***Oral liquid:*** *75 mg/5 ml.* |
| *vancomycin* | ***Powder for injection:*** *250 mg (as hydrochloride) in vial.* |
| ***6.2.3 Antileprosy medicines*** | |
| Medicines used in the treatment of leprosy should never be used except in combination. Combination therapy is essential to prevent the emergence of drug resistance. Colour coded blister packs (MDT blister packs) containing standard two medicine (paucibacillary leprosy) or three medicine (multibacillary leprosy) combinations for adult and childhood leprosy should be used. MDT blister packs can be supplied free of charge through WHO. | |
| clofazimine | **Capsule:** 50 mg; 100 mg. |
| dapsone | **Tablet:** 25 mg; 50 mg; 100 mg. |
| rifampicin | **Solid oral dosage form:** 150 mg; 300 mg. |

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| ***6.2.4 Antituberculosis medicines*** | |
| The Subcommittee recommends and endorses the use of fixed-dose combinations and the development of appropriate new fixed-dose combinations, including modified dosage forms, non-refrigerated products and paediatric dosage forms of assured pharmaceutical quality. | |
| ethambutol | **Oral liquid:** 25 mg/ml.<br>**Tablet:** 100 mg; 400 mg (hydrochloride). |
| isoniazid | **Oral liquid:** 50 mg/5 ml.<br>**Tablet:** 100 mg; 300 mg.<br>**Tablet (scored):** 50 mg. |
| pyrazinamide | **Oral liquid:** 30 mg/ml.<br>**Tablet:** 400 mg.<br>**Tablet (dispersible):** 150 mg.<br>**Tablet (scored):** 150 mg. |
| rifampicin | **Oral liquid:** 20 mg/ml.<br>**Solid oral dosage form:** 150 mg; 300 mg. |
| streptomycin R | **Powder for injection:** 1 g (as sulfate) in vial.<br>R Review of safety and efficacy of streptomycin in childhood TB. |
| ***Complementary List*** | |
| ***Reserve second-line drugs for the treatment of multidrug-resistant tuberculosis (MDR-TB) should be used in specialized centres adhering to WHO standards for TB control.*** R<br>R The Subcommittee requests a review of the medicines for MDR-TB in children. | |
| *amikacin* | ***Powder for injection:*** *100 mg; 500 mg; 1 g in vial.* |
| *capreomycin* | ***Powder for injection:*** *1 g in vial.* |
| *cycloserine* | ***Solid oral dosage form:*** *250 mg.* |
| *ethionamide* | ***Tablet:*** *125 mg; 250 mg.* |
| *kanamycin* | ***Powder for injection:*** *1 g in vial.* |
| *ofloxacin** | ***Tablet:*** *200 mg; 400 mg.*<br>** Levofloxacin may be an alternative based on availability and programme considerations.* |
| *p-aminosalicylic acid* | ***Granules:*** *4 g in sachet.*<br>***Tablet:*** *500 mg.* |
| **6.3 Antifungal medicines** | |
| fluconazole | **Capsule:** 50 mg.<br>**Injection:** 2 mg/ml in vial.<br>**Oral liquid:** 50 mg/5 ml. |
| griseofulvin | **Oral liquid:** 125 mg/5 ml.<br>**Solid oral dosage form:** 125 mg; 250 mg. |

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| nystatin | **Lozenge:** 100 000 IU.<br>**Oral liquid:** 50 mg/5 ml; 100 000 IU/ml.<br>**Tablet:** 100 000 IU; 500 000 IU. |
| ***Complementary List*** | |
| *amphotericin B* | ***Powder for injection:*** *50 mg in vial.*<br>*As deoxycholate or liposomal.* |
| *flucytosine* | ***Capsule:*** *250 mg.*<br>***Infusion:*** *2.5 g in 250 ml.* |
| *potassium iodide* | ***Saturated solution.*** |
| **6.4 Antiviral medicines** | |
| ***6.4.1 Antiherpes medicines*** | |
| aciclovir | **Oral liquid:** 200 mg/5 ml.<br>**Powder for injection:** 250 mg (as sodium salt) in vial.<br>**Tablet:** 200 mg. |
| ***6.4.2 Antiretrovirals*** | |
| Based on current evidence and experience of use, medicines in the following three classes of antiretrovirals are included as essential medicines for treatment and prevention of HIV (prevention of mother-to-child transmission and post-exposure prophylaxis). The Subcommittee emphasizes the importance of using these products in accordance with global and national guidelines. The Subcommittee recommends and endorses the use of fixed-dose combinations and the development of appropriate new fixed-dose combinations, including modified dosage forms, non-refrigerated products and paediatric dosage forms of assured pharmaceutical quality.<br>Scored tablets can be used in children and therefore can be considered for inclusion in the listing of tablets, provided adequate quality products are available. | |
| ***6.4.2.1 Nucleoside/Nucleotide reverse transcriptase inhibitors*** | |
| abacavir (ABC) | **Oral liquid:** 100 mg (as sulfate)/5 ml.<br>**Tablet:** 300 mg (as sulfate)**.** |
| didanosine (ddI) | **Buffered powder for oral liquid:** 100 mg; 167 mg; 250 mg packets.<br>**Capsule (unbuffered enteric-coated):** 125 mg; 200 mg; 250 mg; 400 mg.<br>**Tablet (buffered chewable, dispersible):** 25 mg; 50 mg; 100 mg; 150 mg; 200 mg. |
| emtricitabine (FTC)* **a** | **Capsule:** 200 mg.<br>**Oral liquid:** 10 mg/ml.<br>* FTC is an acceptable alternative to 3TC, based on knowledge of the pharmacology, the resistance patterns and clinical trials of antiretrovirals.<br>**a** >3 months. |
| lamivudine (3TC) | **Oral liquid:** 50 mg/5 ml.<br>**Tablet:** 150 mg. |

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| stavudine (d4T) | **Capsule:** 15 mg; 20 mg; 30 mg.<br>**Powder for oral liquid:** 5 mg/5 ml. |
| zidovudine (ZDV or AZT) | **Capsule:** 100 mg; 250 mg.<br>**Oral liquid:** 50 mg/5 ml.<br>**Solution for IV infusion injection:** 10 mg/ml in 20-ml vial.<br>**Tablet:** 300 mg. |
| ***6.4.2.2 Non-nucleoside reverse transcriptase inhibitors*** | |
| efavirenz (EFV or EFZ) **a** | **Capsule:** 50 mg; 100 mg; 200 mg.<br>**Oral liquid:** 150 mg/5 ml.<br>**Tablet:** 600 mg.<br>**a** >3 years or >10 kg. |
| nevirapine (NVP) | **Oral liquid:** 50 mg/5 ml.<br>**Tablet:** 200 mg. |
| ***6.4.2.3 Protease inhibitors*** | |
| Selection of protease inhibitor(s) from the Model List will need to be determined by each country after consideration of international and national treatment guidelines and experience. Ritonavir is recommended for use in combination as a pharmacological booster, and not as an antiretroviral in its own right. All other protease inhibitors should be used in boosted forms (e.g. with ritonavir). | |
| atazanavir **a** | **Solid oral dosage form:** 100 mg; 150 mg; 300 mg.<br>**a** >25 kg. |
| lopinavir + ritonavir (LPV/r) | **Capsule:** 133.3 mg + 33.3 mg.<br>**Oral liquid:** 400 mg + 100 mg/5 ml.<br>**Tablet (heat stable)**: 100 mg + 25 mg; 200 mg + 50 mg. |
| ritonavir | **Oral liquid:** 400 mg/5 ml.<br>**Solid oral dosage form:** 100 mg.<br>**Tablet (heat stable):** 25 mg; 100 mg. |
| saquinavir (SQV) **a** | **Solid oral dosage form:** 200 mg.<br>**a** >25 kg. |
| ***FIXED-DOSE COMBINATIONS*** | |
| lamivudine + nevirapine + stavudine | **Tablet:** 150 mg + 200 mg + 30 mg.<br>**Tablet (dispersible):**<br>30 mg + 50 mg + 6 mg; 60 mg + 100 mg + 12 mg. |
| lamivudine + nevirapine + zidovudine | **Tablet:** 30 mg + 50 mg + 60 mg; 150 mg + 200 mg + 300 mg. |
| lamivudine + zidovudine | **Tablet:** 30 mg + 60 mg; 150 mg + 300 mg. |

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| ***6.4.3 Other antivirals*** | |
| ribavirin* | **Injection for intravenous administration:** 800 mg and 1 g in 10-ml phosphate buffer solution.<br>**Solid oral dosage form:** 200 mg; 400 mg; 600 mg.<br>* For the treatment of viral haemorrhagic fevers only. |
| **6.5 Antiprotozoal medicines** | |
| ***6.5.1 Antiamoebic and antigiardiasis medicines*** | |
| diloxanide a R | **Tablet**: 500 mg (furoate).<br>a >25 kg.<br>R Review of effectiveness and safety for amoebiasis, with emphasis on comparative efficacy, safety, and age limits compared with oral paromomycin. |
| □ metronidazole | **Injection:** 500 mg in 100-ml vial.<br>**Oral liquid:** 200 mg (as benzoate)/5 ml.<br>**Tablet:** 200 mg to 500 mg. |
| ***6.5.2 Antileishmaniasis medicines*** | |
| amphotericin B | **Powder for injection:** 50 mg in vial.<br>As deoxycholate or liposomal. |
| paromomycin | **Solution for intramuscular injection**: 750 mg of paromomycin base present as the sulfate. |
| sodium stibogluconate or meglumine antimoniate R | **Injection**: 100 mg/ml, 1 vial = 30 ml or 30%, equivalent to approximately 8.1% antimony in 5-ml ampoule.<br>R Review of comparative effectiveness and safety of antimonials for leishmaniasis, and whether they should be kept on the core list or moved to the complementary list. |
| ***6.5.3 Antimalarial medicines*** | |
| ***6.5.3.1 For curative treatment*** | |
| Medicines for the treatment of *P. falciparum* malaria cases should be used in combination. The list currently recommends combinations according to treatment guidelines. The Subcommittee recognizes that not all of these FDCs exist and encourages their development and rigorous testing. The Subcommittee also encourages development and testing of rectal dosage formulations. | |
| amodiaquine* | **Tablet:** 153 mg or 200 mg (as hydrochloride).<br>* To be used (a) in combination with artesunate 50 mg OR (b) may be used alone for the treatment of *P.vivax, P.ovale* and *P.malariae* infections. |
| artemether* | **Oily injection:** 80 mg/ml in 1-ml ampoule.<br>* For use in the management of severe malaria. |
| artemether + lumefantrine* | **Tablet:** 20 mg + 120 mg.<br>**Tablet (dispersible):** 20 mg + 120 mg.<br>* Not recommended in the first trimester of pregnancy or in children below 5 kg. |

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| artesunate* | **Injection:** ampoules, containing 60 mg anhydrous artesunic acid with a separate ampoule of 5% sodium bicarbonate solution.<br>For use in the management of severe malaria.<br>**Rectal dosage form:** 50 mg; 200 mg capsules (for pre-referral treatment of severe malaria only; patients should be taken to an appropriate health facility for follow-up care).<br>**Tablet:** 50 mg.<br>* To be used in combination with either amodiaquine, mefloquine or sulfadoxine + pyrimethamine. |
| chloroquine* | **Oral liquid:** 50 mg (as phosphate or sulfate)/5 ml.<br>**Tablet:** 100 mg; 150 mg (as phosphate or sulfate).<br>* For use only for the treatment of *P.vivax* infection. |
| doxycycline* | **Capsule:** 100 mg (as hydrochloride).<br>**Tablet (dispersible):** 100 mg (as monohydrate).<br>* For use only in combination with quinine. |
| mefloquine* | **Tablet:** 250 mg (as hydrochloride).<br>* To be used in combination with artesunate 50 mg. |
| primaquine* | **Tablet:** 7.5 mg; 15 mg (as diphosphate).<br>* Only for use to achieve radical cure of *P.vivax* and *P.ovale* infections, given for 14 days. |
| quinine* | **Injection:** 300 mg quinine hydrochloride/ml in 2-ml ampoule.<br>**Tablet:** 300 mg (quinine sulfate) or 300 mg (quinine bisulfate).<br>* For use only in the management of severe malaria, and should be used in combination with doxycycline. |
| sulfadoxine + pyrimethamine* | **Tablet:** 500 mg + 25 mg.<br>* Only in combination with artesunate 50 mg. |
| ***6.5.3.2 For prophylaxis*** | |
| chloroquine* | **Oral liquid:** 50 mg (as phosphate or sulfate)/5 ml.<br>**Tablet:** 150 mg (as phosphate or sulfate).<br>* For use only for the treatment of *P.vivax* infection. |
| doxycycline **a** | **Solid oral dosage form:** 100 mg (as hydrochloride).<br>**a** >8 years. |
| mefloquine **a** | **Tablet:** 250 mg (as hydrochloride).<br>**a** >5 kg or >3 months. |
| proguanil* | **Tablet:** 100 mg (as hydrochloride).<br>* For use only in combination with chloroquine. |
| ***6.5.4 Antipneumocystosis and antitoxoplasmosis medicines*** | |
| pyrimethamine | **Tablet:** 25 mg. |

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| sulfadiazine | **Tablet:** 500 mg. |
| sulfamethoxazole + trimethoprim | **Injection**:<br>80 mg + 16 mg/ml in 5-ml ampoule;<br>80 mg + 16 mg/ml in 10-ml ampoule.<br>**Oral liquid:** 200 mg + 40 mg/5 ml.<br>**Tablet:** 100 mg + 20 mg; 400 mg + 80 mg. |
| ***6.5.5 Antitrypanosomal medicines*** R<br>R The Subcommittee requested a review of evidence for effectiveness and safety for medicines for trypanosomiasis in children. | |
| ***6.5.5.1 African trypanosomiasis*** | |
| Medicines for the treatment of 1st stage African trypanosomiasis. | |
| pentamidine* | **Powder for injection:** 200 mg (pentamidine isetionate) in vial.<br>* To be used for the treatment of *Trypanosoma brucei gambiense* infection. |
| suramin sodium* | **Powder for injection:** 1 g in vial.<br>* To be used for the treatment of the initial phase of *Trypanosoma brucei rhodesiense* infection. |
| Medicines for the treatment of 2nd stage African trypanosomiasis | |
| eflornithine* | **Injection:** 200 mg (hydrochloride)/ml in 100-ml bottle.<br>* To be used for the treatment of *Trypanosoma brucei gambiense* infection. |
| melarsoprol | **Injection:** 3.6% solution in 5-ml ampoule (180 mg of active compound). |
| ***6.5.5.2 American trypanosomiasis*** | |
| benznidazole | **Tablet:** 100 mg. |
| nifurtimox | **Tablet:** 30 mg; 120 mg; 250 mg. |
| **7. ANTIMIGRAINE MEDICINES** | |
| **7.1 For treatment of acute attack** | |
| ibuprofen | **Tablet:** 200 mg; 400 mg. |
| paracetamol | **Oral liquid:** 125 mg/5 ml.<br>**Tablet:** 300 mg to 500 mg. |
| **7.2 For prophylaxis** | |
| propranolol | **Tablet:** 20 mg; 40 mg (hydrochloride). |
| **8. ANTINEOPLASTIC, IMMUNOSUPPRESSIVES AND MEDICINES USED IN PALLIATIVE CARE** R<br>R The Subcommittee noted that these immunosuppressives and cytotoxics are essential for children but requested that these medicines be reviewed. | |

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| **8.1 Immunosuppressive medicines** | |
| ***Complementary List*** | |
| *azathioprine* | ***Powder for injection:*** *100 mg (as sodium salt) in vial.*<br>***Tablet:*** *50 mg.* |
| *ciclosporin* | ***Capsule:*** *25 mg.*<br>***Concentrate for injection:*** *50 mg/ml in 1-ml ampoule for organ transplantation.* |
| **8.2 Cytotoxic medicines** | |
| ***Complementary List*** | |
| *allopurinol* | ***Tablet:*** *100 mg to 300 mg.* |
| *asparaginase* | ***Powder for injection:*** *10 000 IU in vial.* |
| *bleomycin* | ***Powder for injection:*** *15 mg (as sulfate) in vial.* |
| *calcium folinate* | ***Injection:*** *3 mg/ml in 10-ml ampoule.*<br>***Tablet:*** *15 mg.* |
| □ *carboplatin* | ***Injection:*** *50 mg/5 ml; 150 mg/15 ml; 450 mg/45 ml; 600 mg/60 ml.* |
| *chlorambucil* | ***Tablet:*** *2 mg.* |
| *cyclophosphamide* | ***Powder for injection:*** *500 mg in vial.*<br>***Tablet:*** *25 mg.* |
| *cytarabine* | ***Powder for injection:*** *100 mg in vial.* |
| *dacarbazine* | ***Powder for injection:*** *100 mg in vial.* |
| *dactinomycin* | ***Powder for injection:*** *500 micrograms in vial.* |
| *daunorubicin* | ***Powder for injection:*** *50 mg (as hydrochloride).* |
| *doxorubicin* | ***Powder for injection:*** *10 mg; 50 mg (hydrochloride) in vial.* |
| *etoposide* | ***Capsule:*** *100 mg.*<br>***Injection:*** *20 mg/ml in 5-ml ampoule.* |
| *fluorouracil* | ***Injection:*** *50 mg/ml in 5-ml ampoule.* |
| *mercaptopurine* | ***Tablet:*** *50 mg.* |
| *methotrexate* | ***Powder for injection:*** *50 mg (as sodium salt) in vial.*<br>***Tablet:*** *2.5 mg (as sodium salt).* |
| *procarbazine* | ***Capsule:*** *50 mg (as hydrochloride).* |
| *vinblastine* | ***Powder for injection:*** *10 mg (sulfate) in vial.* |
| *vincristine* | ***Powder for injection:*** *1 mg; 5 mg (sulfate) in vial.* |
| **8.3 Hormones and antihormones** | |
| ***Complementary List*** | |
| *dexamethasone* | ***Injection:*** *4 mg dexamethasone phosphate (as disodium salt) in 1-ml ampoule.*<br>***Oral liquid****: 2 mg/5 ml.* |

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| *hydrocortisone* | ***Powder for injection:*** *100 mg (as sodium succinate) in vial.* |
| *prednisolone* | ***Oral liquid:*** *5 mg/ml.*<br>***Tablet:*** *5 mg; 25 mg.* |
| **8.4 Medicines used in palliative care** | |
| amitriptyline | **Tablet:** 10 mg; 25 mg. |
| cyclizine | **Injection:** 50 mg/ml.<br>**Tablet:** 50 mg. |
| dexamethasone | **Injection:** 4 mg/ml.<br>**Tablet:** 2 mg. |
| diazepam | **Injection:** 5 mg/ml.<br>**Oral liquid:** 2 mg/5 ml.<br>**Rectal solution:** 2.5 mg; 5 mg; 10 mg.<br>**Tablet**: 5 mg; 10 mg. |
| docusate sodium | **Capsule:** 100 mg.<br>**Oral liquid:** 50 mg/5 ml. |
| hyoscine hydrobromide | **Injection:** 400 micrograms/ml; 600 micrograms/ml.<br>**Transdermal patches:** 1 mg/72 hours. |
| ibuprofen* a | **Oral liquid:** 100 mg/5 ml.<br>**Tablet:** 200 mg; 400 mg; 600 mg.<br>* Specific use for management of bone pain.<br>a Not in children less than 3 months. |
| midazolam | **Injection:** 1 mg/ml; 5 mg/ml. |
| morphine | **Granules (modified release) (to mix with water):** 20 mg; 30 mg; 60 mg; 100 mg; 200 mg.<br>**Injection**: 10 mg/ml.<br>**Oral liquid**: 10 mg/5 ml.<br>**Tablet (controlled release)**: 10 mg; 30 mg; 60 mg.<br>**Tablet (immediate release):** 10 mg. |
| senna | **Oral liquid:** 7.5 mg/5 ml. |
| ~~**9. ANTIPARKINSONISM MEDICINES**~~ | |
| **10. MEDICINES AFFECTING THE BLOOD** | |
| **10.1 Antianaemia medicines** R<br>R The Subcommittee proposed a review of the evidence for appropriate dose combinations of iron and folic acid for children. | |
| ferrous salt | **Oral liquid:** equivalent to 25 mg iron (as sulfate)/ml.<br>**Tablet:** equivalent to 60 mg iron. |
| folic acid | **Tablet:** 1 mg; 5 mg. |
| hydroxocobalamin | **Injection:** 1 mg in 1-ml ampoule. |

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| **10.2 Medicines affecting coagulation** | |
| phytomenadione | **Injection:** 1 mg/ml; 10 mg/ml in 5-ml ampoule.<br>**Tablet**: 10 mg. |
| ***Complementary List*** | |
| *heparin sodium* | ***Injection:*** *1000 IU/ml; 5000 IU/ml in 1-ml ampoule.* |
| *protamine sulfate* | ***Injection:*** *10 mg/ml in 5-ml ampoule.* |
| ☐ *warfarin* | ***Tablet:*** *0.5 mg; 1 mg; 2 mg; 5 mg (sodium salt).* |
| **11. BLOOD PRODUCTS AND PLASMA SUBSTITUTES** | |
| **11.1 Plasma substitutes** R<br>R The Subcommittee requested a review to determine whether these medicines are essential for children. | |
| **11.2 Plasma fractions for specific use** | |
| All plasma fractions should comply with the WHO Requirements for the Collection, Processing and Quality Control of Blood, Blood Components and Plasma Derivatives (Revised 1992). (WHO Technical Report Series, No. 840, 1994, Annex 2). | |
| ***Complementary List*** | |
| ☐ *factor VIII concentrate* | ***Dried.*** |
| ☐ *factor IX complex (coagulation factors, II, VII, IX, X) concentrate* | ***Dried.*** |
| *human normal immunoglobulin* | ***Intramuscular administration:*** *16% protein solution.**<br>***Intravenous administration:*** *5%; 10% protein solution.***<br>***Subcutaneous administration:*** *15%; 16% protein solution.**<br>* *Indicated for primary immune deficiency.*<br>***Indicated for primary immune deficiency and Kawasaki disease.* |
| **12. CARDIOVASCULAR MEDICINES** | |
| ~~**12.1 Antianginal medicines**~~ | |
| **12.2 Antiarrhythmic medicines** R<br>R The Subcommittee noted the potential importance of these medicines and requested a review to determine which of these medicines are essential for children. | |
| **12.3 Antihypertensive medicines** | |
| ☐ enalapril | **Tablet:** 2.5 mg; 5 mg. |
| **12.4 Medicines used in heart failure** | |
| digoxin | **Injection:** 250 micrograms/ml in 2-ml ampoule.<br>**Oral liquid:** 50 micrograms/ml.<br>**Tablet:** 62.5 micrograms; 250 micrograms. |
| furosemide | **Injection:** 10 mg/ml in 2-ml ampoule.<br>**Oral liquid:** 20 mg/5 ml.<br>**Tablet:** 40 mg. |

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| *Complementary List* | |
| *dopamine* R | ***Injection:*** *40 mg (hydrochloride) in 5-ml vial.*<br>R Review of safety and efficacy of dopamine in children. |
| ~~**12.5 Antithrombotic medicines**~~ | |
| **12.6 Lipid-lowering agents** R<br>R The Subcommittee noted the potential importance of these medicines in children but requested a review of the section before endorsing any medicine as essential. | |
| **13. DERMATOLOGICAL MEDICINES (topical)** | |
| **13.1 Antifungal medicines** | |
| benzoic acid + salicylic acid | **Cream or ointment:** 6% + 3%. |
| □ miconazole | **Cream or ointment:** 2% (nitrate). |
| *Complementary List* | |
| *selenium sulfide* | ***Detergent-based suspension:*** *2%.* |
| **13.2 Anti-infective medicines** R<br>R The Subcommittee requested a review of safety of topical antibiotics including tetracycline ointment in neonates. | |
| □ methylrosanilinium chloride (gentian violet) R | **Aqueous solution:** 0.5%.<br>**Tincture:** 0.5%.<br>R Review of safety and toxicity of gentian violet. |
| neomycin sulfate + □ bacitracin | **Ointment:** 5 mg neomycin sulfate + 250 IU bacitracin zinc/g. |
| potassium permanganate | **Aqueous solution:** 1:10 000. |
| silver sulfadiazine a | **Cream:** 1%<br>a >2 months. |
| **13.3 Anti-inflammatory and antipruritic medicines** | |
| □ betamethasone a | **Cream or ointment:** 0.1% (as valerate).<br>a Hydrocortisone preferred in neonates. |
| calamine lotion | **Lotion.** |
| hydrocortisone | **Cream or ointment:** 1% (acetate). |
| **13.4 Astringent medicines** R<br>R The Subcommittee requested a review to determine whether these medicines are essential for children. | |
| **13.5 Medicines affecting skin differentiation and proliferation** | |
| benzoyl peroxide | **Cream or lotion:** 5%. |
| coal tar | **Solution:** 5%. |
| □ podophyllum resin | **Solution:** 10% to 25%. |
| salicylic acid | **Solution:** 5%. |
| urea | **Cream or ointment:** 10%. |

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| **13.6 Scabicides and pediculicides** | |
| ☐ benzyl benzoate **a** R | **Lotion:** 25%.<br>**a** >2 years.<br>R Review of alternatives to benzyl benzoate for use in younger children (possible role for sulfur-based preparations in younger children). |
| permethrin | **Cream:** 5%.<br>**Lotion:** 1%. |
| **14. DIAGNOSTIC AGENTS** | |
| **14.1 Ophthalmic medicines** | |
| fluorescein | **Eye drops:** 1% (sodium salt). |
| ☐ tropicamide | **Eye drops:** 0.5%. |
| **14.2 Radiocontrast media** R | |
| R The Subcommittee requested a review of possible alternative contrast agents for use in children. | |
| *Complementary List* | |
| *barium sulfate* | ***Aqueous suspension.*** |
| **15. DISINFECTANTS AND ANTISEPTICS** | |
| **15.1 Antiseptics** | |
| ☐ chlorhexidine | **Solution:** 5% (digluconate); 20% (digluconate) (needs to be diluted prior to use for cord care). |
| ☐ ethanol | **Solution:** 70% (denatured). |
| ☐ polyvidone iodine | **Solution:** 10%. |
| **15.2 Disinfectants** | |
| ☐ chlorine base compound | **Powder:** (0.1% available chlorine) for solution. |
| ☐ chloroxylenol | **Solution:** 4.8%. |
| glutaral | **Solution:** 2%. |
| **16. DIURETICS** | |
| furosemide | **Injection:** 10 mg/ml in 2-ml ampoule.<br>**Oral liquid:** 20 mg/5 ml.<br>**Tablet:** 10 mg; 20 mg; 40 mg. |
| *Complementary List* | |
| ☐ *hydrochlorothiazide* | ***Tablet (scored):*** *25 mg.* |
| *mannitol* R | ***Injectable solution****: 10%; 20%.*<br>R Review of comparative efficacy, safety and place in therapy of mannitol in children. |
| *spironolactone* R | ***Oral liquid:*** *5 mg/5 ml; 10 mg/5 ml; 25 mg/5 ml.*<br>***Tablet:*** *25 mg.*<br>R Review of comparative efficacy, safety and place in therapy of spironolactone in children. |

| 17. GASTROINTESTINAL MEDICINES | |
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| *Complementary List* | |
| ☐ *pancreatic enzymes* | *Age-appropriate formulations and doses including lipase, protease and amylase.* |
| **17.1 Antacids and other antiulcer medicines** | |
| aluminium hydroxide | **Oral liquid:** 320 mg/5 ml.<br>**Tablet:** 500 mg. |
| magnesium hydroxide | **Oral liquid:** equivalent to 550 mg magnesium oxide/10 ml. |
| ☐ omeprazole | **Powder for oral liquid:** 20 mg; 40 mg sachets.<br>**Solid oral dosage form:** 10 mg; 20 mg; 40 mg. |
| ☐ ranitidine | **Injection:** 25 mg/ml in 2-ml ampoule.<br>**Oral liquid:** 75 mg/5 ml.<br>**Tablet:** 150 mg (as hydrochloride). |
| **17.2 Antiemetic medicines** | |
| dexamethasone | **Injection:** 4 mg/ml in 1-ml ampoule.<br>**Oral liquid:** 0.5 mg/5 ml; 2 mg/5 ml.<br>**Solid oral dosage form:** 0.5 mg; 0.75 mg; 1.5 mg; 4 mg. |
| metoclopramide **a** | **Injection:** 5 mg (hydrochloride)/ml in 2-ml ampoule.<br>**Oral liquid:** 5 mg/5 ml.<br>**Tablet:** 10 mg (hydrochloride).<br>**a** Not in neonates. |
| ondansetron **a** | **Injection:** 2 mg base/ml in 2-ml ampoule (as hydrochloride).<br>**Oral liquid:** 4 mg base/ 5 ml.<br>**Solid oral dosage form:** Eq 4 mg base; Eq 8 mg base.<br>**a** >1 month. |
| ~~**17.3 Anti-inflammatory medicines**~~ | |
| **17.4 Laxatives** R<br>R The Subcommittee noted the potential importance of these medicines in children but requested a review of the section before endorsing any medicine as essential. | |

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| **17.5 Medicines used in diarrhoea** | |
| ***17.5.1 Oral rehydration*** | |
| oral rehydration salts | glucose: 75 mEq<br>sodium: 75 mEq or mmol/L<br>chloride: 65 mEq or mmol/L<br>potassium: 20 mEq or mmol/L<br>citrate: 10 mmol/L<br>osmolarity: 245 mOsm/L<br>glucose: 13.5 g/L<br>sodium chloride: 2.6 g/L<br>potassium chloride: 1.5 g/L<br>trisodium citrate dihydrate+: 2.9 g/L<br>+ trisodium citrate dihydrate may be replaced by sodium hydrogen carbonate (sodium bicarbonate) 2.5 g/L. However, as the stability of this latter formulation is very poor under tropical conditions, it is only recommended when manufactured for immediate use.<br>**Powder for dilution** in 200 ml; 500 ml; 1 L. |
| ***17.5.2 Medicines for diarrhoea in children*** | |
| zinc sulfate* | **Oral liquid:** in 10 mg per unit dosage forms.<br>**Tablet:** in 10 mg per unit dosage forms.<br>* In acute diarrhoea zinc sulfate should be used as an adjunct to oral rehydration salts. |
| ~~***17.5.3 Antidiarrhoeal (symptomatic) medicines in adults***~~ | |
| **18. HORMONES, OTHER ENDOCRINE MEDICINES AND CONTRACEPTIVES** | |
| **18.1 Adrenal hormones and synthetic substitutes** | |
| fludrocortisone | **Tablet:** 100 micrograms. |
| hydrocortisone | **Tablet:** 5 mg; 10 mg; 20 mg. |
| ~~**18.2 Androgens**~~ | |
| ~~**18.3 Contraceptives**~~ | |
| ~~***18.3.1 Oral hormonal contraceptives***~~ | |
| ~~***18.3.2 Injectable hormonal contraceptives***~~ | |
| ~~***18.3.3 Intrauterine devices***~~ | |
| ~~***18.3.4 Barrier methods***~~ | |
| ~~**18.3.5 Implantable contraceptives**~~ | |
| ~~**18.4 Estrogens**~~ | |
| **18.5 Insulins and other antidiabetic agents** | |
| insulin injection (soluble) | **Injection:** 100 IU/ml in 10-ml vial. |
| intermediate-acting insulin | **Injection:** 100 IU/ml in 10-ml vial<br>(as compound insulin zinc suspension or isophane insulin). |
| *Complementary List* | |
| *metformin* | ***Tablet:*** *500 mg (hydrochloride).* |

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| ~~**18.6 Ovulation inducers**~~ | |
| ~~**18.7 Progestogens**~~ | |
| **18.8 Thyroid hormones and antithyroid medicines** | |
| levothyroxine | **Tablet:** 25 micrograms; 50 micrograms; 100 micrograms (sodium salt). |
| ***Complementary List*** | |
| *Lugol's solution* | ***Oral liquid:*** *about 130 mg total iodine/ml.* |
| *potassium iodide* | ***Tablet:*** *60 mg.* |
| *propylthiouracil* R | ***Tablet:*** *50 mg.*<br>R Review of use of propylthiouracil in children and appropriateness of carbimazole as an alternative. |
| **19. IMMUNOLOGICALS** | |
| **19.1 Diagnostic agents** | |
| All tuberculins should comply with the WHO Requirements for Tuberculins (Revised 1985). WHO Expert Committee on Biological Standardization. Thirty-sixth report. (WHO Technical Report Series, No. 745, 1987, Annex 1). | |
| tuberculin, purified protein derivative (PPD) | **Injection.** |
| **19.2 Sera and immunoglobulins** | |
| All plasma fractions should comply with the WHO Requirements for the Collection, Processing and Quality Control of Blood, Blood Components and Plasma Derivatives (Revised 1992). WHO Expert Committee on Biological Standardization. Forty-third report. (WHO Technical Report Series, No. 840, 1994, Annex 2). | |
| antitetanus immunoglobulin (human) | **Injection:** 500 IU in vial. |
| antivenom immunoglobulin* | **Injection.**<br>* Exact type to be defined locally. |
| diphtheria antitoxin | **Injection:** 10 000 IU; 20 000 IU in vial. |
| ☐ rabies immunoglobulin | **Injection:** 150 IU/ml in vial. |
| **19.3 Vaccines** | |
| Selection of vaccines from the Model List will need to be determined by each country after consideration of international recommendations, epidemiology and national priorities. The list below details the vaccines for which there is either a recommendation from the Strategic Advisory Group of Experts on Immunization (SAGE) (http://www.who.int/immunization/sage_conclusions/en/index.html) and/or a WHO position paper (http://www.who.int/immunization/documents/positionpapers/en/index.html). This site will be updated as new position papers are published and contains the most recent information and recommendations. All vaccines should comply with the WHO Requirements for Biological Substances.<br>The Subcommittee noted the need for vaccines used in children to be polyvalent. | |
| BCG vaccine | |
| cholera vaccine | |

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| diphtheria vaccine | |
| hepatitis A vaccine | |
| hepatitis B vaccine | |
| *Haemophilus influenzae* type b vaccine | |
| influenza vaccine | |
| Japanese encephalitis vaccine | |
| measles vaccine | |
| meningococcal meningitis vaccine | |
| mumps vaccine | |
| pertussis vaccine | |
| pneumococcal vaccine | |
| poliomyelitis vaccine | |
| rabies vaccine | |
| rotavirus vaccine | |
| rubella vaccine | |
| tetanus vaccine | |
| typhoid vaccine | |
| varicella vaccine | |
| yellow fever vaccine | |
| **20. MUSCLE RELAXANTS (PERIPHERALLY-ACTING) AND CHOLINESTERASE INHIBITORS** R<br>R The Subcommittee recommended a review of the alternatives available for use in children. | |
| neostigmine | **Injection:** 500 micrograms in 1-ml ampoule; 2.5 mg (metilsulfate) in 1-ml ampoule.<br>**Tablet:** 15 mg (bromide). |
| suxamethonium | **Injection:** 50 mg (chloride)/ml in 2-ml ampoule.<br>**Powder for injection:** (chloride), in vial. |
| □ vecuronium | **Powder for injection**: 10 mg (bromide) in vial. |
| *Complementary List* | |
| *pyridostigmine* | ***Injection**: 1 mg in 1-ml ampoule.*<br>***Tablet**: 60 mg (bromide).* |
| **21. OPHTHALMOLOGICAL PREPARATIONS** R<br>R The Subcommittee requested a review of newer medicines for potential additions to this list. | |
| **21.1 Anti-infective agents** | |
| aciclovir | **Ointment:** 3% W/W. |

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| ☐ gentamicin | **Solution (eye drops):** 0.3% (sulfate). |
| ☐ tetracycline | **Eye ointment:** 1% (hydrochloride). |
| **21.2 Anti-inflammatory agents** | |
| ☐ prednisolone | **Solution (eye drops):** 0.5% (sodium phosphate). |
| **21.3 Local anaesthetics** | |
| ☐ tetracaine **a** | **Solution (eye drops):** 0.5% (hydrochloride).<br>**a** Not in preterm neonates. |
| ~~**21.4 Miotics and antiglaucoma medicines**~~ | |
| **21.5 Mydriatics** | |
| atropine* **a** | **Solution (eye drops):** 0.1%; 0.5%; 1% (sulfate).<br>* OR homatropine OR cyclopentolate.<br>**a** >3 months. |
| *Complementary List* | |
| *epinephrine (adrenaline)* R | ***Solution (eye drops):*** *2% (as hydrochloride).*<br>R Review of anti-infective eye drops, identifying which are most appropriate for use in children. |
| ~~**22. OXYTOCICS AND ANTIOXYTOCICS**~~ | |
| ~~**22.1 Oxytocics**~~ | |
| ~~**22.2 Antioxytocics (tocolytics)**~~ | |
| **23. PERITONEAL DIALYSIS SOLUTION** | |
| *Complementary List* | |
| *intraperitoneal dialysis solution (of appropriate composition)* | ***Parenteral solution.*** |
| **24. PSYCHOTHERAPEUTIC MEDICINES** R<br>R The Subcommittee noted the potential importance of these medicines in children for a variety of disorders and requests a review of the entire section before endorsing any medicine as essential. | |
| **24.1 Medicines used in psychotic disorders** | |
| *Complementary List* | |
| *chlorpromazine* | ***Injection:*** *25 mg (hydrochloride)/ml in 2-ml ampoule.*<br>***Oral liquid:*** *25 mg (hydrochloride)/5 ml.*<br>***Tablet:*** *10 mg; 25 mg; 50 mg; 100 mg (hydrochloride).* |
| *haloperidol* | ***Injection:*** *5 mg in 1-ml ampoule.*<br>***Oral liquid:*** *2 mg/ml.*<br>***Solid oral dosage form:*** *0.5 mg; 2 mg; 5 mg.* |

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| **24.2 Medicines used in mood disorders** | |
| ***24.2.1 Medicines used in depressive disorders*** | |
| *Complementary List* | |
| *fluoxetine* **a** | ***Solid oral dosage form:*** *20 mg (present as hydrochloride).*<br>**a** >8 years. |
| ***24.2.2 Medicines used in bipolar disorders*** R | |
| **24.3 Medicines used in generalized anxiety** R | |
| **24.4 Medicines used for obsessive compulsive disorders and panic attacks** R | |
| **24.5 Medicines used in substance dependence programmes** R | |
| **25. MEDICINES ACTING ON THE RESPIRATORY TRACT** | |
| **25.1 Antiasthmatic medicines** | |
| ☐ budesonide | **Inhalation (aerosol):** 100 micrograms per dose; 200 micrograms per dose. |
| epinephrine (adrenaline) | **Injection:** 1 mg (as hydrochloride or hydrogen tartrate) in 1-ml ampoule. |
| ☐ salbutamol* | **Injection:** 50 micrograms (as sulfate)/ml in 5-ml ampoule.<br>**Metered dose inhaler (aerosol):** 100 micrograms (as sulfate) per dose.<br>**Oral liquid:** 2 mg/5 ml.<br>**Respirator solution for use in nebulizers:** 5 mg (as sulfate)/ml.<br>**Tablet:** 2 mg; 4 mg (as sulfate).<br>* Oral salbutamol treatment should only be considered when inhaled asthma therapy is not feasible. |
| **26. SOLUTIONS CORRECTING WATER, ELECTROLYTE AND ACID-BASE DISTURBANCES** | |
| **26.1 Oral** | |
| oral rehydration salts | See section 17.5.1. |
| potassium chloride | **Powder for solution.** |
| **26.2 Parenteral** | |
| glucose | **Injectable solution:** 5% (isotonic); 10% (hypertonic); 50% (hypertonic). |
| glucose with sodium chloride | **Injectable solution:** 5% glucose, 0.9% sodium chloride (equivalent to 150 mmol/L Na+ and 150 mmol/L Cl-); 5% glucose, 0.45% sodium chloride (equivalent to 75 mmol/L Na+ and 75 mmol/L Cl-). |
| potassium chloride | **Solution for dilution:** 7.5% (equivalent to K 1 mmol/ml and Cl 1 mmol/ml); 15% (equivalent to K 2 mmol/ml and Cl 2 mmol/ml). |
| sodium chloride | **Injectable solution:** 0.9% isotonic (equivalent to Na+ 154 mmol/L, Cl- 154 mmol/L). |

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| sodium hydrogen carbonate | **Injectable solution:** 1.4% isotonic (equivalent to $Na^+$ 167 mmol/L, $HCO_3^-$ 167 mmol/L).<br>**Solution:** 8.4% in 10-ml ampoule (equivalent to $Na^+$ 1000 mmol/L, $HCO_3^-$ 1000 mmol/L). |
| ☐ sodium lactate, compound solution | **Injectable solution.** |
| **26.3 Miscellaneous** | |
| water for injection | 2-ml; 5-ml; 10-ml ampoules. |
| **27. VITAMINS AND MINERALS** R<br>R The Subcommittee noted the need for a review of this section of the list to meet public health needs in children. | |
| ascorbic acid | **Tablet:** 50 mg. |
| cholecalciferol* | **Oral liquid:** 400 IU/ml.<br>**Solid oral dosage form:** 400 IU; 1000 IU.<br>* Ergocalciferol can be used as an alternative. |
| iodine | **Capsule:** 200 mg.<br>**Iodized oil:** 1 ml (480 mg iodine); 0.5 ml (240 mg iodine) in ampoule (oral or injectable); 0.57 ml (308 mg iodine) in dispenser bottle. |
| pyridoxine | **Tablet:** 25 mg (hydrochloride). |
| retinol | **Capsule:** 100 000 IU; 200 000 IU (as palmitate).<br>**Oral oily solution:** 100 000 IU (as palmitate)/ml in multidose dispenser.<br>**Tablet (sugar-coated):** 10 000 IU (as palmitate).<br>**Water-miscible injection:** 100 000 IU (as palmitate) in 2-ml ampoule. |
| riboflavin | **Tablet:** 5 mg. |
| sodium fluoride | In any appropriate topical formulation. |
| thiamine | **Tablet:** 50 mg (hydrochloride). |
| ***Complementary List*** | |
| *calcium gluconate* | ***Injection:*** *100 mg/ml in 10-ml ampoule.* |
| **28. EAR, NOSE AND THROAT CONDITIONS IN CHILDREN** R<br>R Review of role of leukotriene antagonists in the management of childhood allergic rhinitis. | |
| acetic acid | **Topical:** 2%, in alcohol. |
| ☐ budesonide | **Nasal spray:** 100 micrograms per dose. |
| ☐ ciprofloxacin | **Topical:** 0.3% drops. |
| ☐ xylometazoline a | **Nasal spray:** 0.05%.<br>a Not in children less than 3 months. |

| **29. SPECIFIC MEDICINES FOR NEONATAL CARE** | |
|---|---|
| caffeine citrate | **Injection:** 20 mg/ml (equivalent to 10 mg caffeine base/ml).<br>**Oral liquid:** 20 mg/ml (equivalent to 10 mg caffeine base/ml). |
| ***Complementary List*** | |
| ☐ *ibuprofen* | ***Solution for injection***: 5 mg/ml. |
| ☐ *prostaglandin E* | ***Solution for injection:***<br>***Prostaglandin E1:*** 0.5 mg/ml in alcohol.<br>***Prostaglandin E2:*** 1 mg/ml. |
| *surfactant* | ***Suspension for intratracheal instillation:*** *25 mg/ml or 80 mg/ml.* |

## Table 1: Medicines with age and weight restrictions

| | |
|---|---|
| atazanavir | >25 kg |
| atropine | >3 months |
| benzyl benzoate | >2 years |
| betamethasone topical preparations | Hydrocortisone preferred in neonates |
| cefazolin | >1 month |
| ceftriaxone | >41 weeks corrected gestational age |
| chlorphenamine | >1 year |
| diloxanide | >25 kg |
| doxycycline | >8 years (except for serious infections e.g. cholera) |
| efavirenz | >3 years or >10 kg |
| emtrictabine | >3 months |
| fluoxetine | >8 years |
| ibuprofen | >3 months (except IV form for patent *ductus arteriosus*) |
| mefloquine | >5 kg or >3 months |
| metoclopramide | Not in neonates |
| ondansetron | >1 month |
| saquinavir | >25 kg |
| silver sulfadiazine | >2 months |
| tetracaine | Not in preterm neonates |
| trimethoprim | >6 months |
| xylometazoline | >3 months |

# Annex 1: Explanation of dosage forms

## A. Principal dosage forms used in EMLc - Oral administration

| Term | Definition |
|---|---|
| **Solid oral dosage form** | Refers to tablets or capsules or other solid dosage forms such as 'melts' that are immediate-release preparations. It implies that there is no difference in clinical efficacy or safety between the available dosage forms, and countries should therefore choose the form(s) to be listed depending on quality and availability.<br><br>The term 'solid oral dosage form' is *never* intended to allow any type of modified-release tablet. |
| **Tablet** | Refers to:<br><br>• uncoated or coated (film-coated or sugar-coated) tablets that are intended to be swallowed whole;<br>• unscored and scored*;<br>• tablets that are intended to be chewed before being swallowed;<br>• tablets that are intended to be dispersed or dissolved in water or another suitable liquid before being swallowed;<br>• tablets that are intended to be crushed before being swallowed.<br><br>The term 'tablet' without qualification is *never* intended to allow any type of modified-release tablet. |
| **Tablet (qualified)** | Refers to a specific type of tablet:<br>**chewable** - tablets that are intended to be chewed before being swallowed;<br>**dispersible** - tablets that are intended to be dispersed in water or another suitable liquid before being swallowed;<br>**soluble** - tablets that are intended to be dissolved in water or another suitable liquid before being swallowed;<br>**crushable** - tablets that are intended to be crushed before being swallowed;<br>**scored** - tablets bearing a break mark or marks where sub-division is intended in order to provide doses of less than one tablet;<br>**sublingual** - tablets that are intended to be placed beneath the tongue.<br><br>The term 'tablet' is *always* qualified with an additional term (in parentheses) in entries where one of the following types of tablet is intended: **gastro-resistant** (such tablets may sometimes be described as enteric-coated or as delayed-release), **prolonged-release** or another modified-release form. |

* Scored tablets may be divided for ease of swallowing, provided dose is a whole number of tablets.

| Term | Definition |
|---|---|
| **Capsule** | Refers to hard or soft capsules.<br><br>The term 'capsule' without qualification is *never* intended to allow any type of modified-release capsule. |
| **Capsule (qualified)** | The term 'capsule' with qualification refers to **gastro-resistant** (such capsules may sometimes be described as enteric-coated or as delayed-release), **prolonged-release** or another modified-release form. |
| **Granules** | Preparations that are issued to patient as granules to be swallowed without further preparation, to be chewed, or to be taken in or with water or another suitable liquid.<br><br>The term 'granules' without further qualification is *never* intended to allow any type of modified-release granules. |
| **Oral powder** | Preparations that are issued to patient as powder (usually as single-dose) to be taken in or with water or another suitable liquid. |
| **Oral liquid** | Liquid preparations intended to be *swallowed* i.e. oral solutions, suspensions, emulsions and oral drops, including those constituted from powders or granules, but *not* those preparations intended for *oromucosal administration* e.g. gargles and mouthwashes.<br><br>Oral liquids presented as powders or granules may offer benefits in the form of better stability and lower transport costs. If more than one type of oral liquid is available on the same market (e.g. solution, suspension, granules for reconstitution), they may be interchanged and in such cases should be bioequivalent. It is preferable that oral liquids do not contain sugar and that solutions for children do not contain alcohol. |

## B. Principal dosage forms used in EMLc - Parenteral administration

| Term | Definition |
|---|---|
| **Injection** | Refers to solutions, suspensions and emulsions including those constituted from powders or concentrated solutions. |
| **Injection (qualified)** | Route of administration is indicated in parentheses where relevant. |
| **Injection (oily)** | The term injection is qualified by (oily) in relevant entries. |
| **Intravenous infusion** | Refers to solutions and emulsions including those constituted from powders or concentrated solutions. |

## C. Other dosage forms

| Mode of administration | Term to be used |
|---|---|
| **To the eye** | Eye drops, eye ointments. |
| **Topical** | For liquids: lotions, paints.<br>For semi-solids: cream, ointment. |
| **Rectal** | Suppositories, gel or solution. |
| **Vaginal** | Pessaries or vaginal tablets. |
| **Inhalation** | Powder for inhalation, pressurized inhalation, nebulizer. |

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